



Cable Reel/Cable/Angle/Length Replacement Instructions



Rev 0 ACQE 090319



7055 Morning Dove Way, Roscoe, IL 61073
Office 815.270.0088

Website : www.controlsystemsw.com E-mail : waynem@controlsystemsw.com

Contents (ACT/ACQ)

<i>Cable Reel Removal</i>	<i>Page 3-7</i>
<i>Cable Reel Replacement</i>	<i>Page 8</i>
<i>Cable Reel Layout</i>	<i>Page 9-10</i>
<i>Cable Reel Angle Adjustments</i>	<i>Page 11-12</i>
<i>Cable Reel Radius Adjustments</i>	<i>Page 13</i>
<i>Cable Broken repair</i>	<i>Page 14-16</i>
<i>Cable Replacement</i>	<i>Page 17-23</i>
<i>Cable reel angle pot replacement</i>	<i>Page 24-25</i>
<i>Cable reel length pot replacement</i>	<i>Page 26-29</i>

Cable Reel replacement Instructions (ACT/ACQ)

Fully retract the boom and lower it to zero degrees, now turn the power off the system.



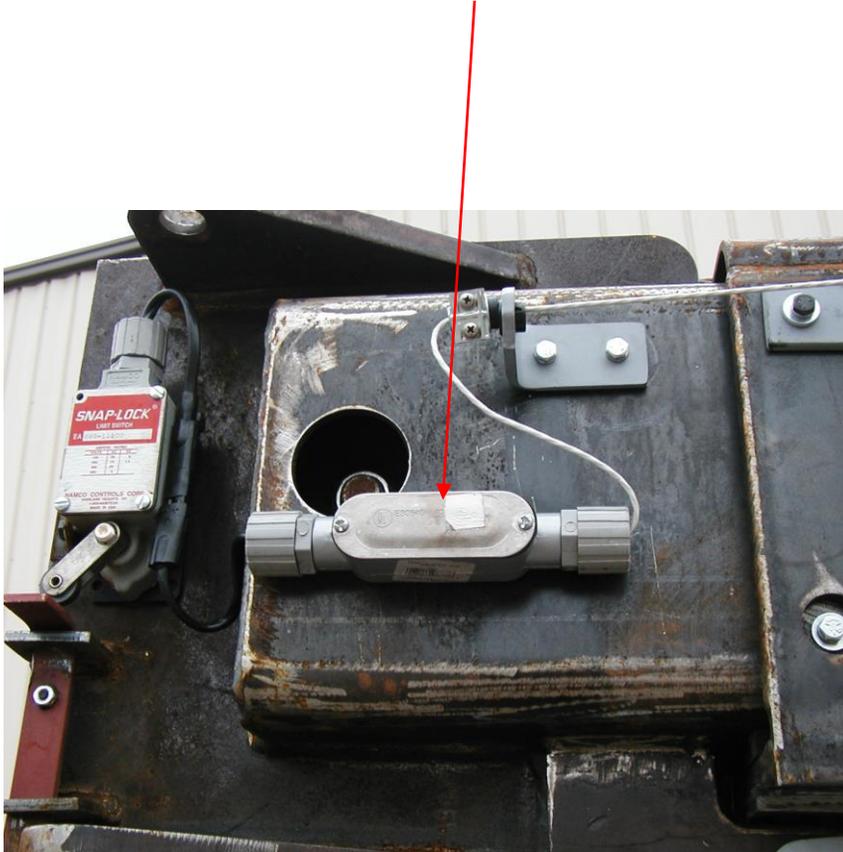
Cable Reel replacement Instructions (ACT/ACQ)

Disconnect the cable that comes from the swivel area of the machine at the cable disconnect located by the slip ring collector for the cable reel.



Cable Reel replacement Instructions (ACT/ACQ)

Disconnect the wires at the junction box for the A-2-B switch



Note:

For cable reels with two conductor cable connect the red and gray wires for the A-2-B circuit in the boom tip junction box.

For cable reels with three conductor cable connect the red and green wires for the A-2-B circuit in the boom tip junction box.

Cable Reel replacement Instructions (ACT/ACQ)

CAUTION: THE CABLE REEL IS UNDER TENSION!!

DO NOT RELEASE THE CABLE AND ALLOW IT TO RETRACT ON ITS OWN.

DAMAGE CAN OCCUR TO THE GEAR ASSEMBLY.

Remove the cable clamp and rubber grommet, save it for later. Hold on to the cable and slowly release the cable back towards the cable reel by hand to release the tension.



Cable Reel replacement Instructions (ACT/ACQ)

Remove the four mounting bolts on the cable reel that attach it to the boom and replace the cable reel with the replacement cable reel. Tighten the four bolts.



Cable Reel replacement Instructions (ACT/ACQ)

The replacement reel has a coil of excess wire and a clamp on it (Fig 1). Pull the cable out through the roller-guides to the boom tip. Measure how much of the excess wire you need to re-connect the wires to the junction box for the A-2-B switch and cut off the excess wire.

Attach the cable clamp and rubber grommet you removed (Fig 2) and connect the wires to the junction box. Remove the clamp back and rubber grommet at the cable reel.

When completed you should have tension on the cable from the reel (Fig 3) in order for the reel to wind up properly, if not readjust the cable clamp to tension it more.

Fig 1.

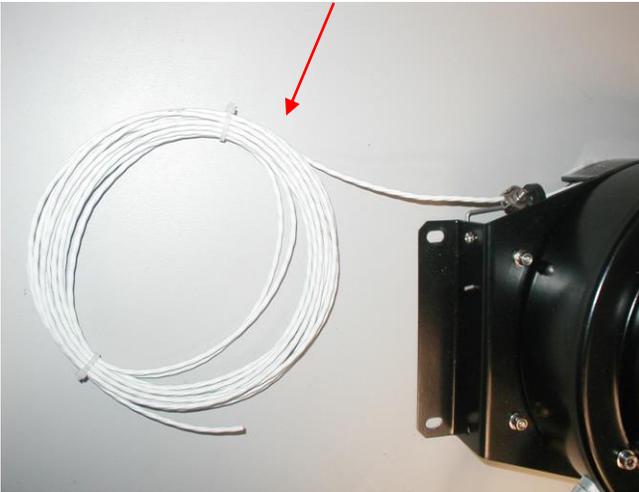


Fig 2

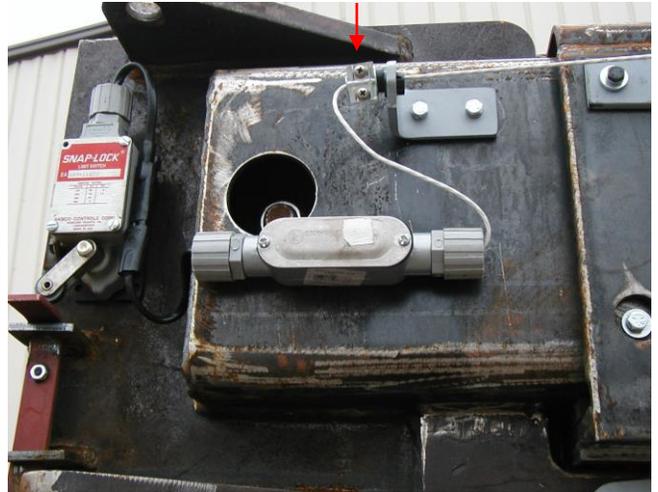


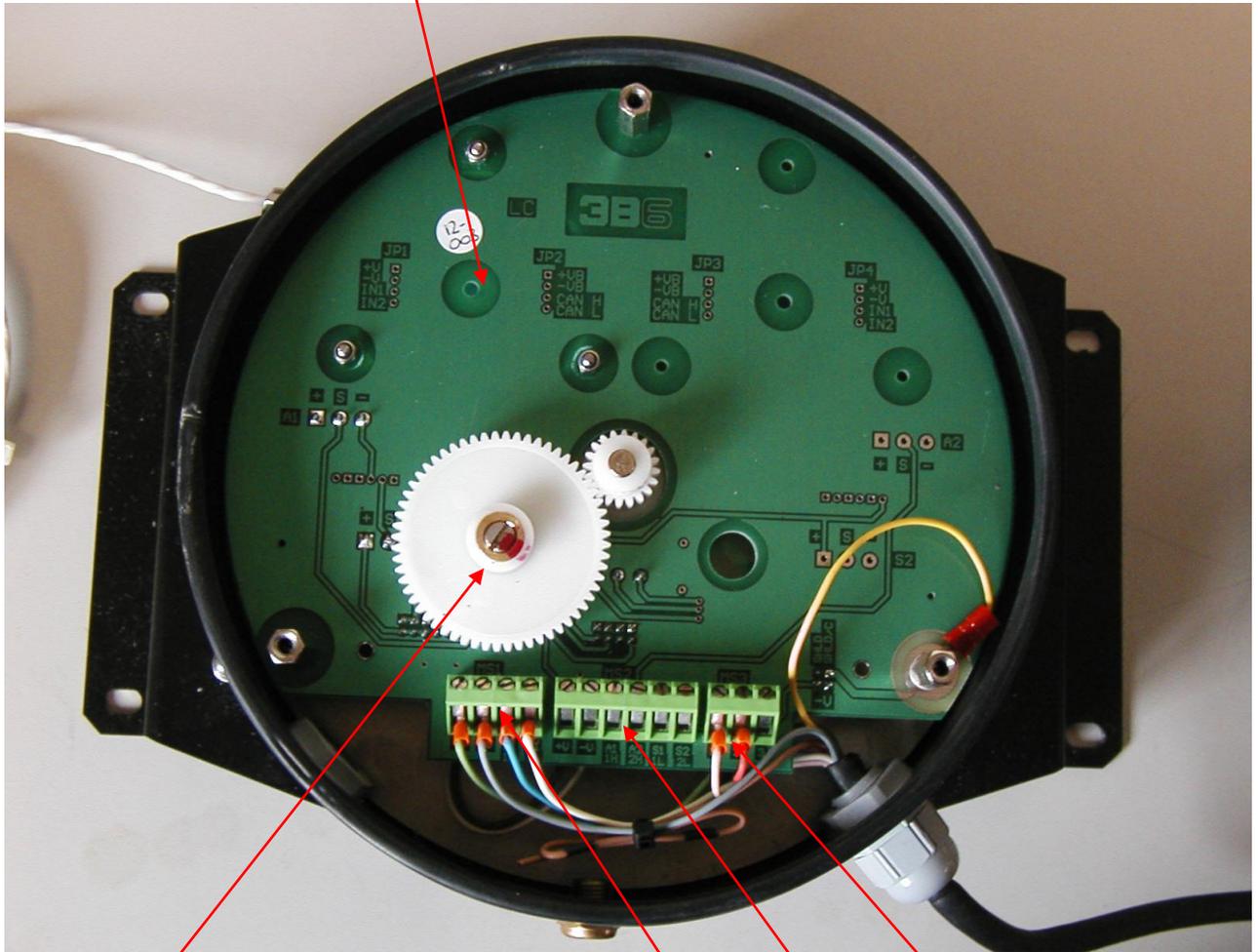
Fig 3



CABLE REEL ACT/ACQ Layout

1. The reel is equipped with three separate terminal strips MS1, MS2, and MS3. MS1 and MS3 are used.

Angle Pot is located on back side of electronic



Length Pot Assembly

MS1

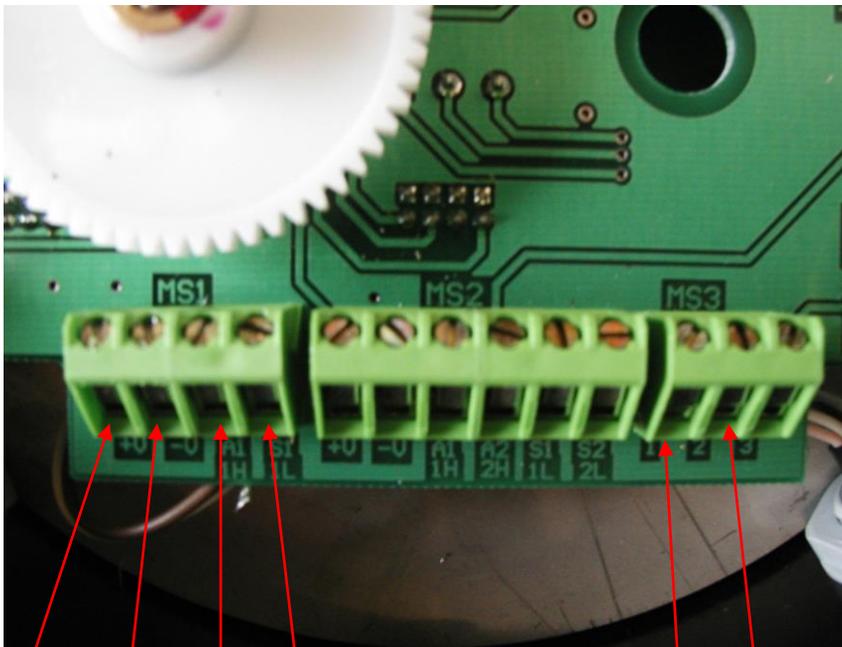
MS2

MS3

CABLE REEL ACT/ACQ

Layout/Wiring

1. MS1
2. +V = +5vdc supply voltage for angle/length/ Green wire
3. -V = Ground/Gray wire
4. A1 = Angle output/Blue wire Zero degrees output should be +2.50vdc
5. L1 = Length output/White wire Fully retracted boom output should be +0.250vdc



+5vdc	Ground	Angle	Length	A-2-B return	A-2-B +12vdc
-------	--------	-------	--------	-----------------	-----------------

1. MS2 Not used

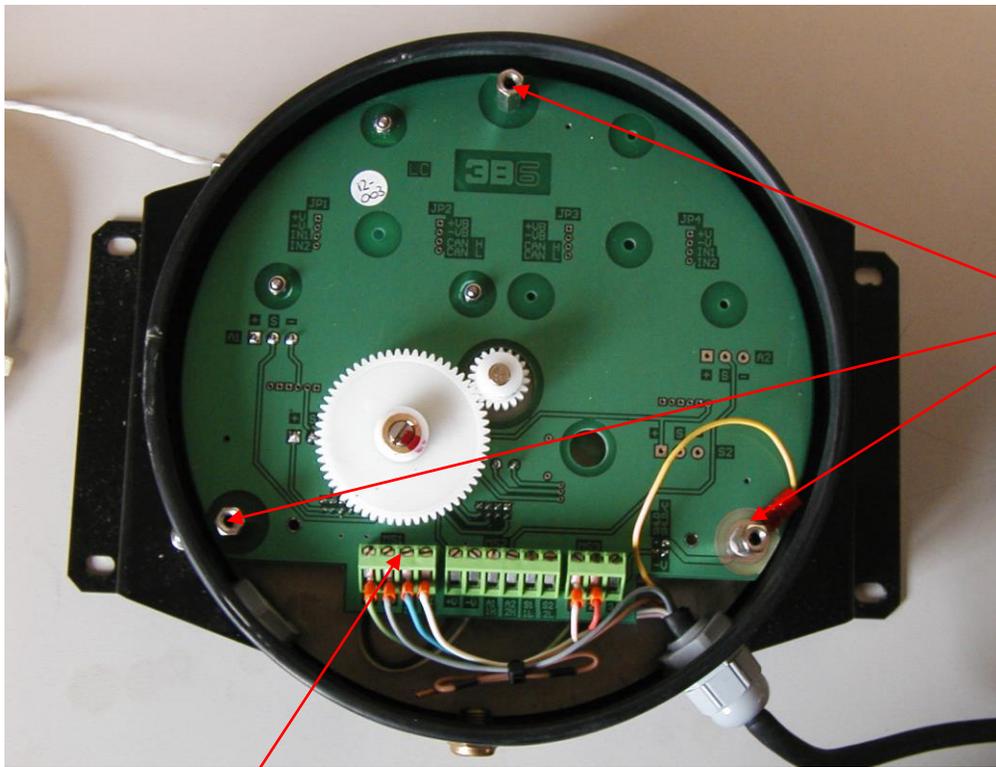
1. MS3
2. #1 A-2-B return/pink wire
3. #2 A-2-B +12vdc supply/red wire
4. Yellow wire is shield to be connected to the pc board mounting lug

CABLE REEL ACT

Setting Angle on calibrated units

To set the angle;

Fully retract the boom, and boom the machine down to zero degrees using a level or angle finder to determine zero degrees.. Look at the display to see what the angle indication is. Remove the three mounting lugs on the pc board. See next page, Tip the pc board out and loosen the three angle pot mounting screws. Holding the pc board as close to vertical as possible turn the angle pot until the display indicates zero degrees. Tighten the three angle pot screws and replace the mounting lugs on the pc board. Do not forget to connect the shield. Check the angle indication again on the display. Adjust as needed until it indicates zero degrees. Tighten all screws and close reel. At zero degrees the angle output on MS1/A1 should be approximately +2.50vdc (range + 2.48vdc to 2.51vdc).



PC board mounting lugs

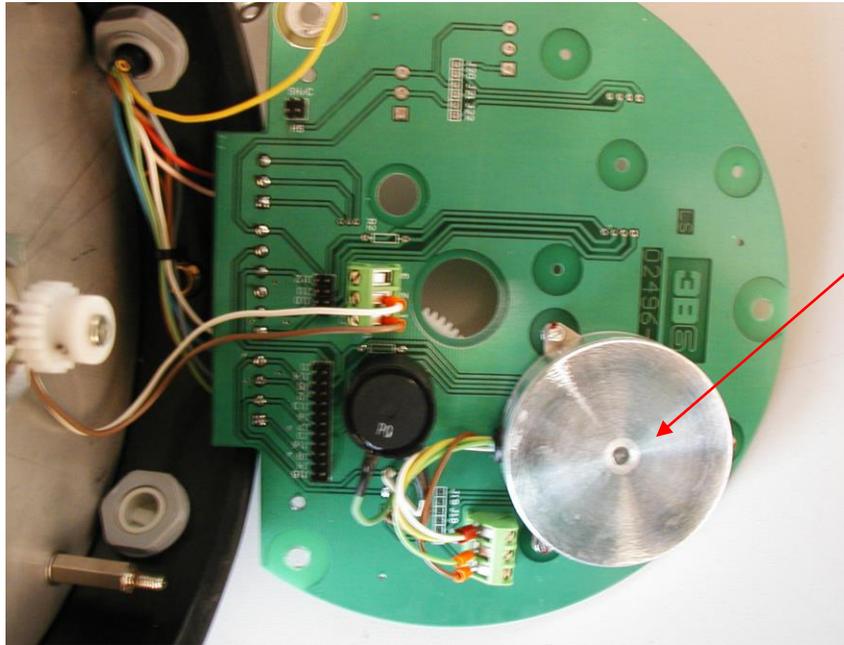
MS1/A1 Angle output

NOTE: newer style pots have two posts for mounting. Adjustment is made by moving the PCB after installed and then tighten hardware



CABLE REEL ACT/ACQ

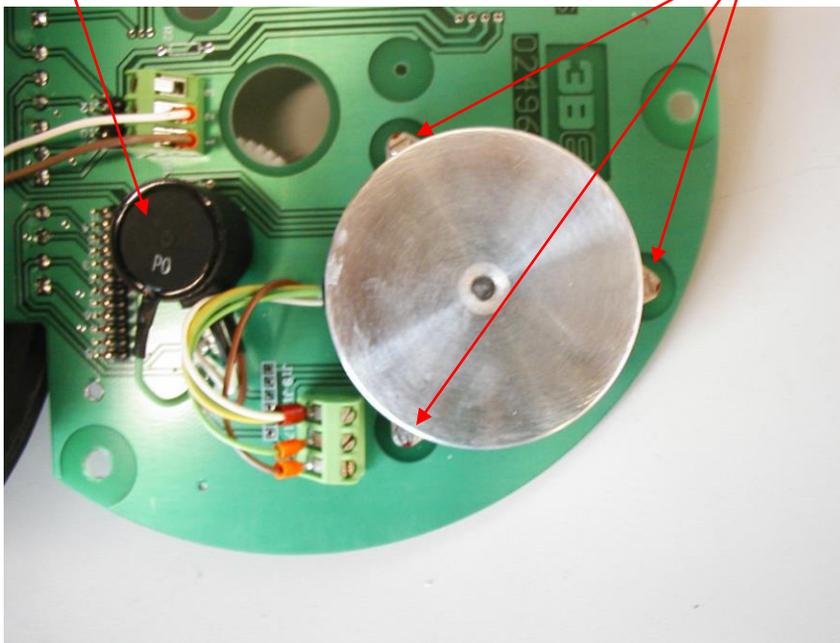
Setting Angle on calibrated units



Angle Pot

Length Pot

Angle Pot screws



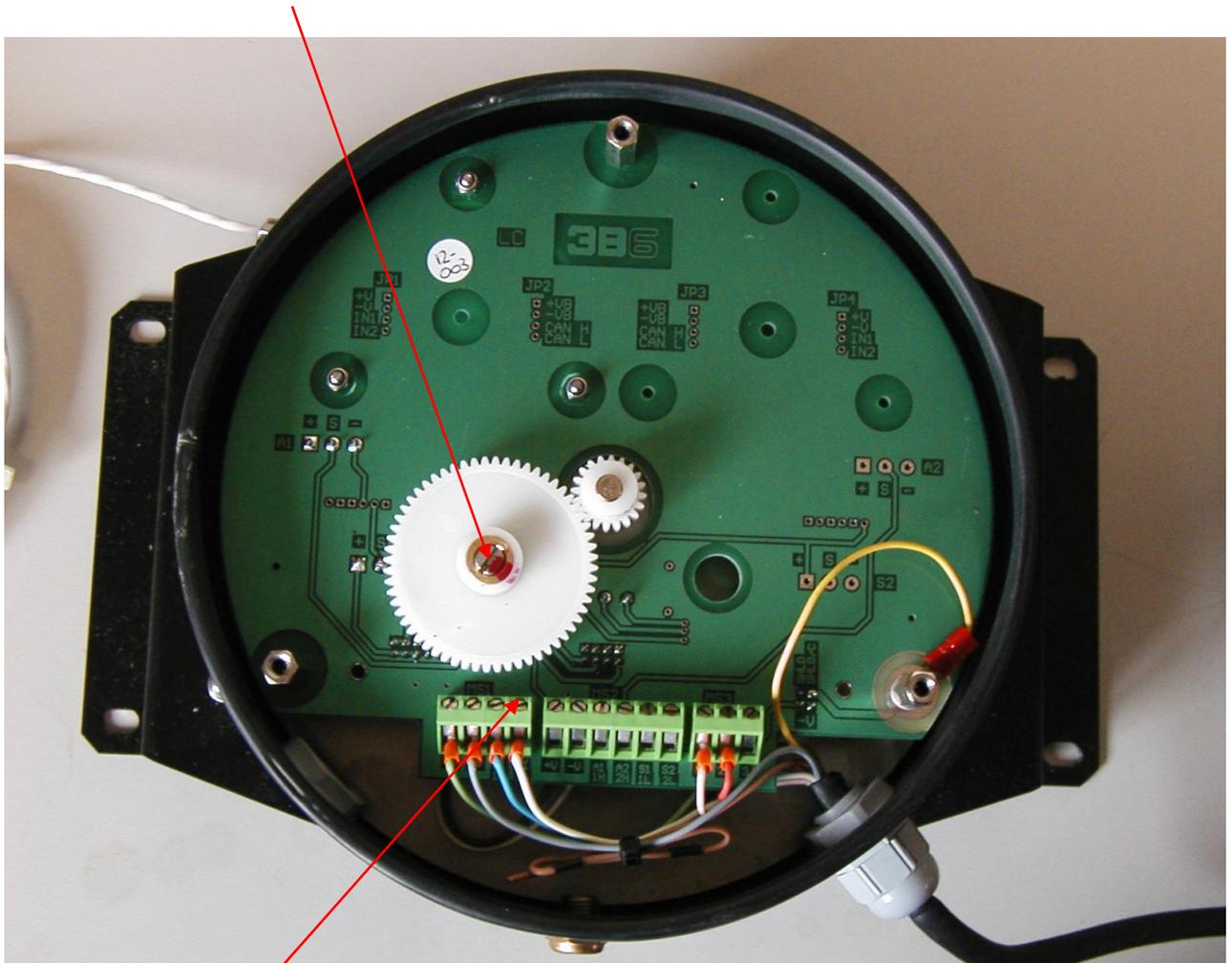
CABLE REEL ACT/ACQ

Setting Radius on calibrated units

To set the Radius;

Fully retract the boom, and lower boom to zero degrees, look at the display to see what the radius indication is. Using a flat tip screw driver turn the screw on the length pot assembly until the radius indication on the display is correct. Now extend the boom fully and check it, then retract it again to see if it is ok. Continue this procedure until the radius indication is correct. MS1/L1 should be approximately +0.250vdc (range + 0.248vdc to 0.251vdc).

Length pot adjustment screw

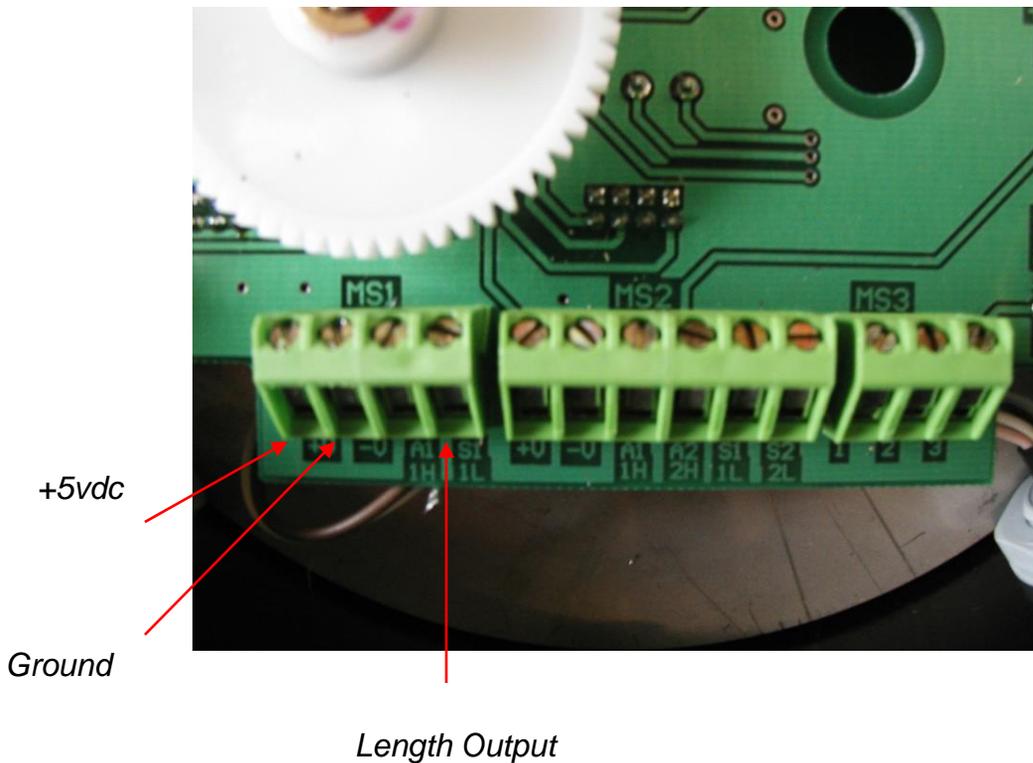


MS1/L1 Length output

CABLE REEL ACT/ACQ

Broken Cable repair

1. Check if the length assembly is damaged internal of the cable reel by physically pulling the cable out by hand and listen for a clicking sound when pulling it out. We are checking to see if the spring package internal of the cable reel has been damaged. If no clicking noise is present, spring package should be ok.
2. Remove the cable reel cover and physically check for any broken components. Using a voltage meter put the ground lead on terminal $-VB$ (ground) and the positive lead on terminal $+VB$ of MS1. With power on the system it should be $+5.00$ vdc (range of $+4.96$ to $+5.00$ vdc). If not check length pot for damage inside cable reel.
3. Check between $-VB$ and S1 on MS1 for an output. Should be at least $+0.250$ vdc. Pull out some cable on the reel and check again to see if length pot is ok, voltage should increase.



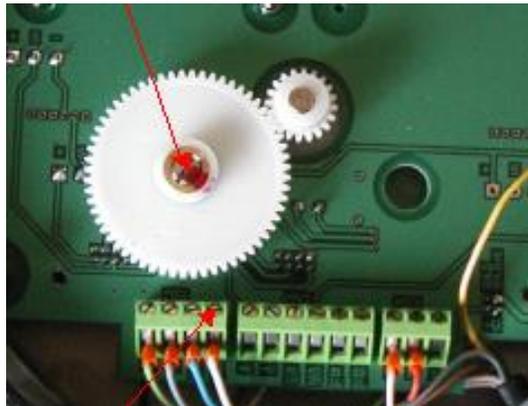
CABLE REEL ACT/ACQ

Broken Cable repair

4. *If the cable was cut close to the end of the boom, there should be enough cable left on the reel to re-connect. There shall be at least three wraps of cable left on the cable reel drum with a fully extended boom in order to use the existing cable. Otherwise the cable must be replaced.*

5. ***Fully retract the boom and at zero degrees, reconnect the cable at the tip of the boom tip. The cable should have some tension on it so the cable does not droop, but taunt. Turn on the power of the system and using a volt meter check the length output on S1 of MS1 terminal on the terminal.***

6. *Output needs to be +0.250vdc (range +0.248 to 0.251vdc, if not using a small flat tip screwdriver adjust the screw on the length pot until it is close. Now look to the radius read out on the display. It should indicate the minimum radius of the machine in feet and tenths. See below.*



		Boom Radius	Feet/tenths
		Minimum	Maximum
IC-20-1		6.2	15.2
IC-35-2		7.5	19.6
IC-80-1		8.4	20.3
IC-80-2		9.8	24.3
IC-80-3		11.8	30.2

CABLE REEL ACT/ACQ

Broken Cable repair

7. **Boom at zero degrees and extend the boom** out and check for the maximum boom radius on the display. Fully retract the boom and check the minimum boom radius again adjust if required until the display indicates the proper radius.

8. *The boom radius is not set. The system was already calibrated, therefore we only need to adjust the length pot at the minimum radius. The system should be checked at min and max radius and will indicate the proper radius in all positions of extension in feet and tenths.*

9. *Replace the cable reel cover and tighten hardware properly.*

		Boom Radius	Feet/tenths
		Minimum	Maximum
IC-20-1		6.2	15.2
IC-35-2		7.5	19.6
IC-80-1		8.4	20.3
IC-80-2		9.8	24.3
IC-80-3		11.8	30.2

CABLE REEL ACT/ACQ

Cable Replacement

Disconnect the cable reel connector by the slip-ring collector and remove the four mounting bolts on the cable reel and remove the reel from the machine.



CABLE REEL ACT/ACQ

Cable Replacement

Lay the cable reel on the top cover on a flat surface. See below.



CABLE REEL ACT/ACQ

Cable Replacement

Tools required for cable replacement. Phillips screwdriver, wire cutters, heat shrink, and soldering gun with small tip.

Remove the tension from the reel if not already done and remove the screws that hold the wiring down.

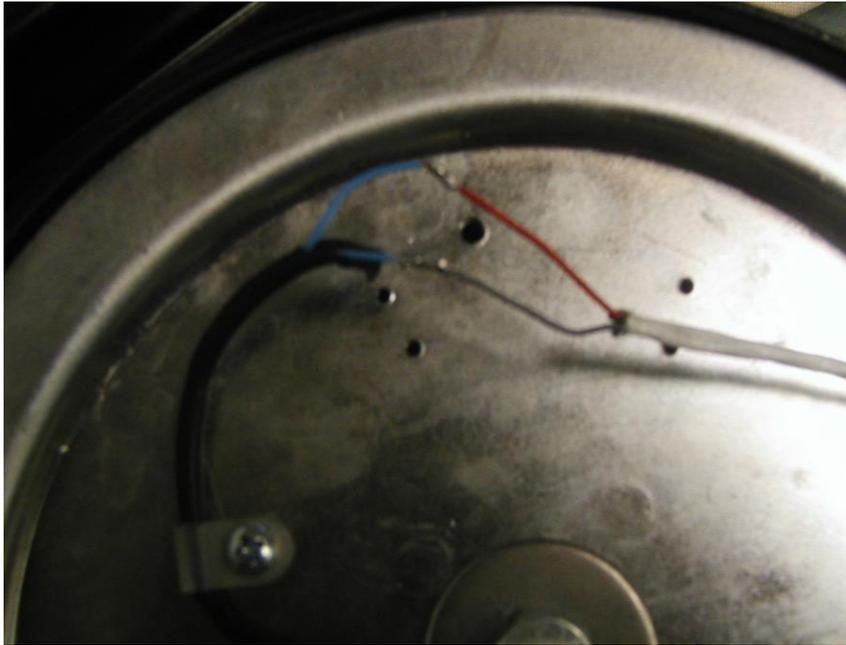


CABLE REEL ACT/ACQ

Cable Replacement

Using the small wire cutters carefully remove the existing heat shrink from the wires.

With your soldering gun disconnect the wires. Remove the cable reel cable and replace it with new.



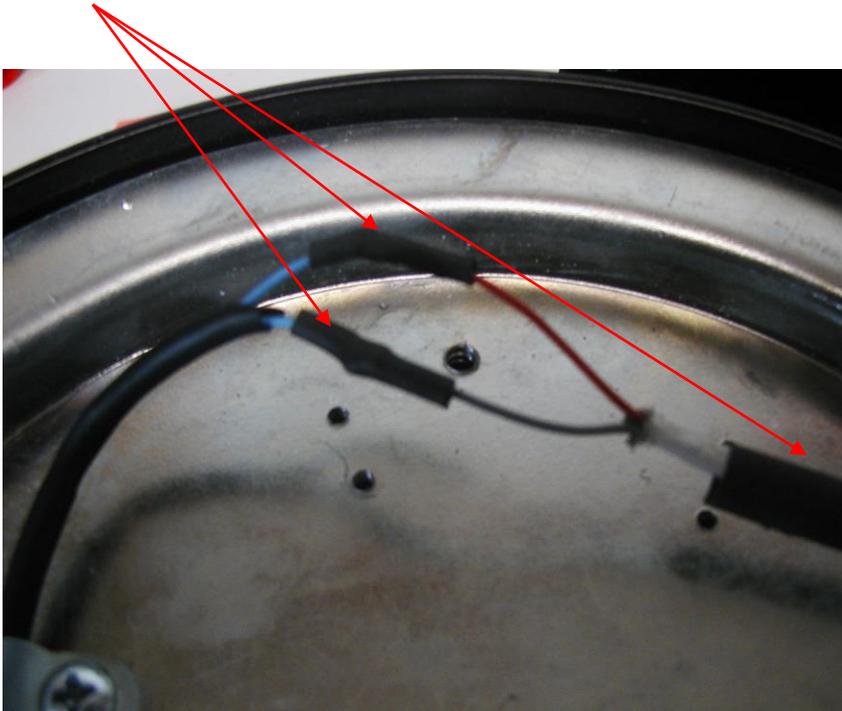
CABLE REEL ACT/ACQ

Cable Replacement

Feed the new cable through the hole as the old cable came off and reel new cable back on reel drum.

Using heat shrink put it on each wire before soldering it and a larger piece on the cable reel wire.

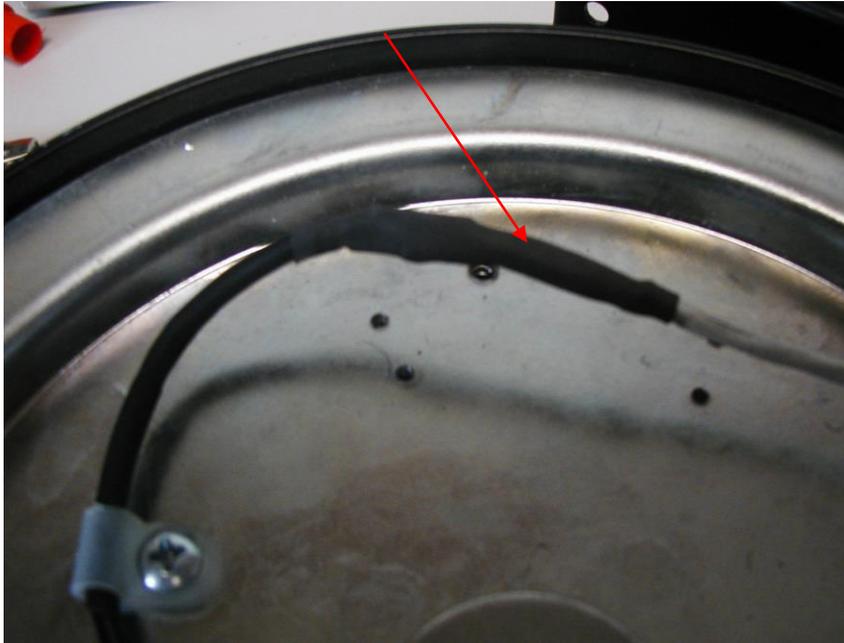
There will be one small piece of heat shrink to cover each wire soldered and one larger piece to cover the entire cable once you have soldered the wires together.



CABLE REEL ACT/ACQ

Cable Replacement

Once you have soldered and heat shrunk the small wires, Slide the larger heat shrink over all wires and heat shrink it. reconnect the cable clamps and tighten screws



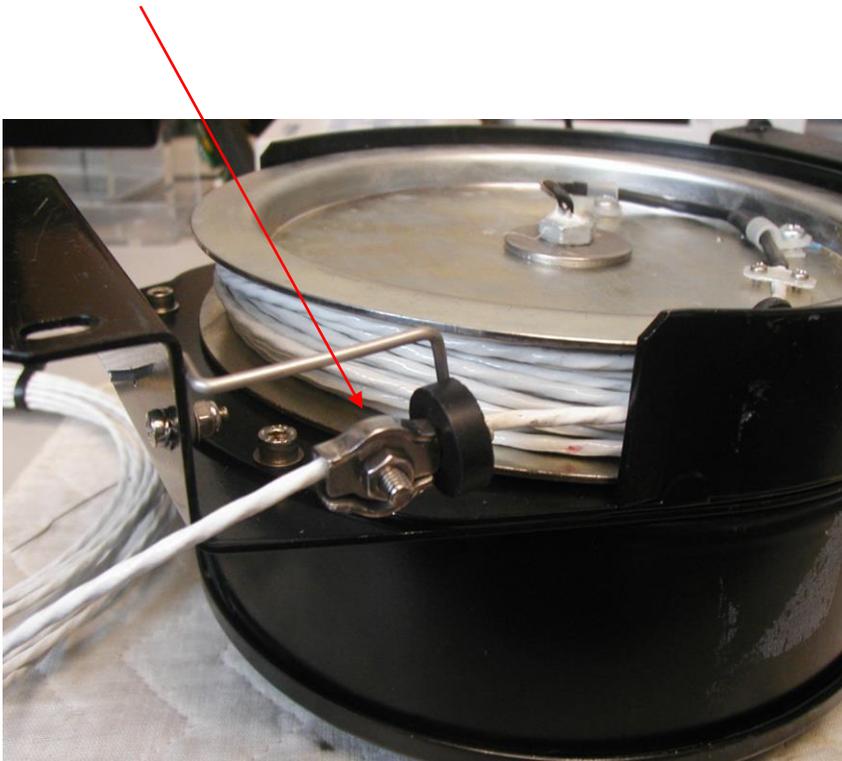
CABLE REEL ACT/ACQ

Cable Replacement

Turn the drum and put five revolutions of tension on the cable reel drum.

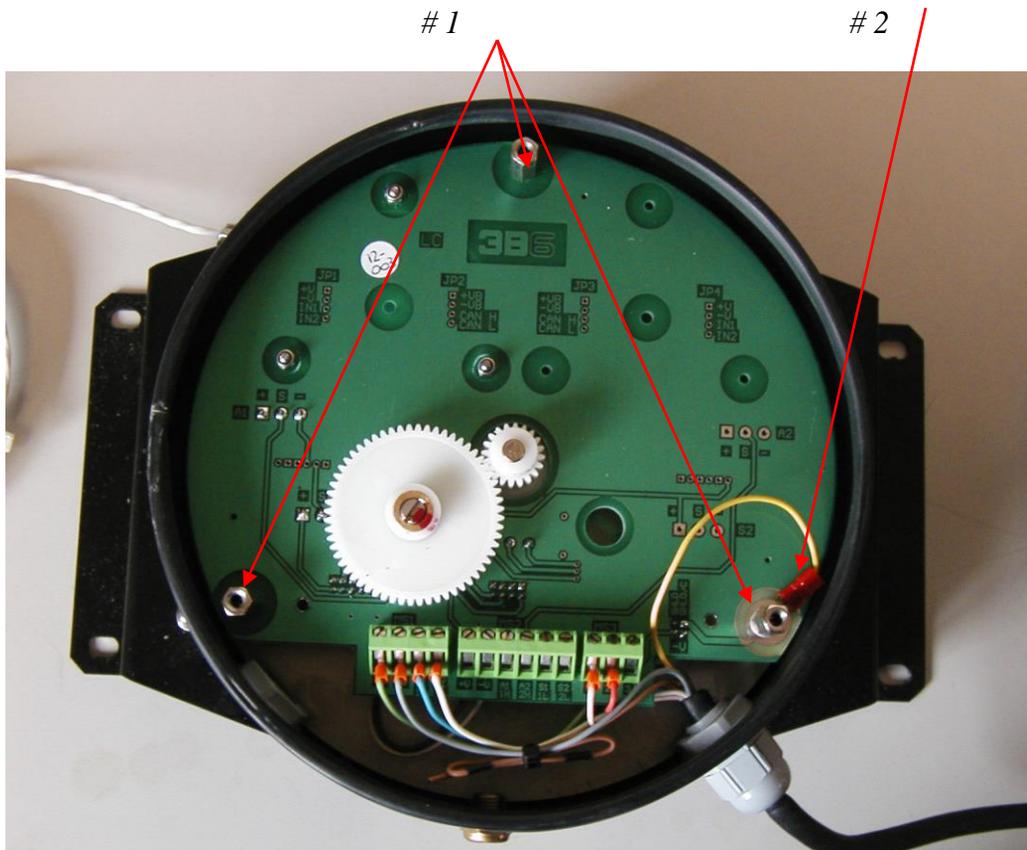
Then using the strain relief clamp it to the front of the guide. Now go to page 6 and follow

To page 16 use the pages for broken cable replacement for calibration.



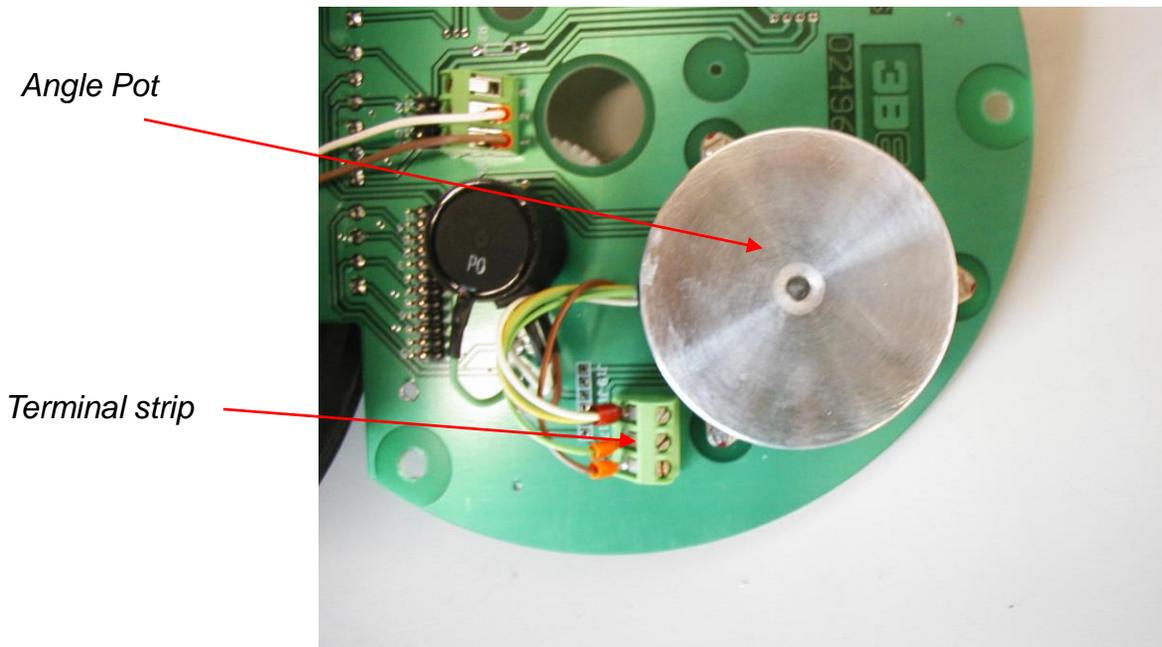
ACT Angle (ASA) pot replacment

1. Remove the three socket mounting lugs from the reel using a 8mm socket and place them with the cover.
2. Remove the grounding wire from the lug.



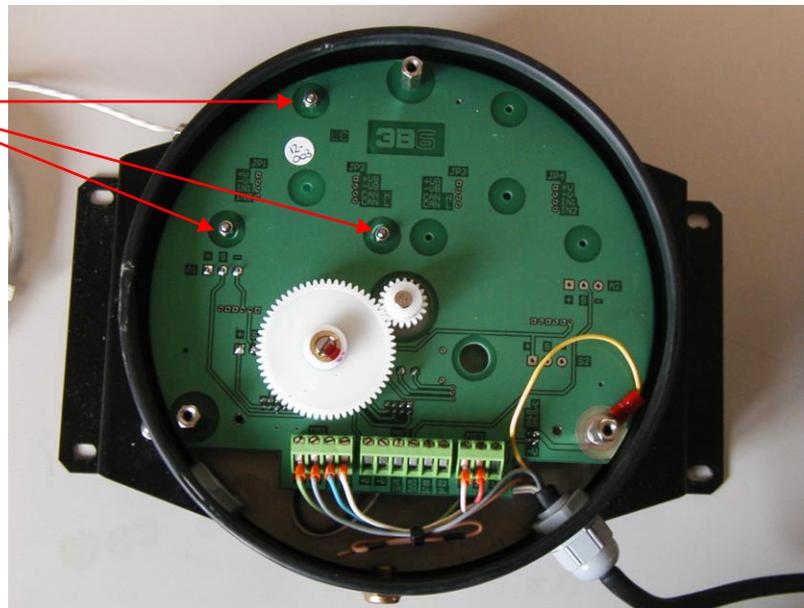
ACT Angle pot replacement

1. Carefully fold the pcb over to access the angle pot on the back side of the pcb. Do not let the pcb hang from the wiring, which will result in damage to the A-2-B or other wiring.
2. Loosen the three screws using a small flat tip screwdriver backside of pcb and a 5mm wrench on the front side of the pcb to remove the angle pot. Remove the wiring from the terminal strip. Now replace the angle pot in the same orientation as the one that was removed (make note of where the wires come out of the pot). Connect the wiring and see page 11 for adjustment or proceed to page 26 for length procedure.



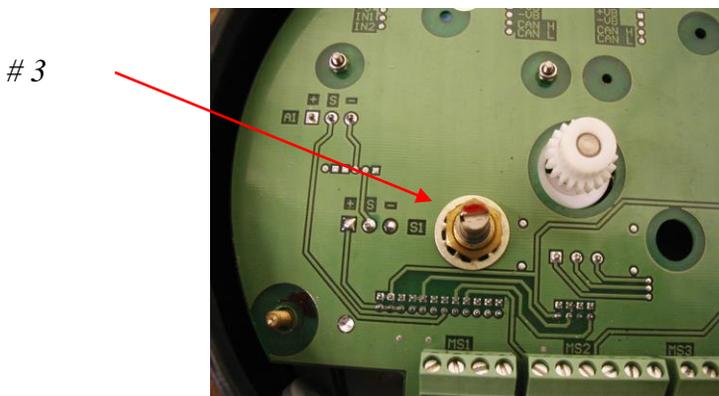
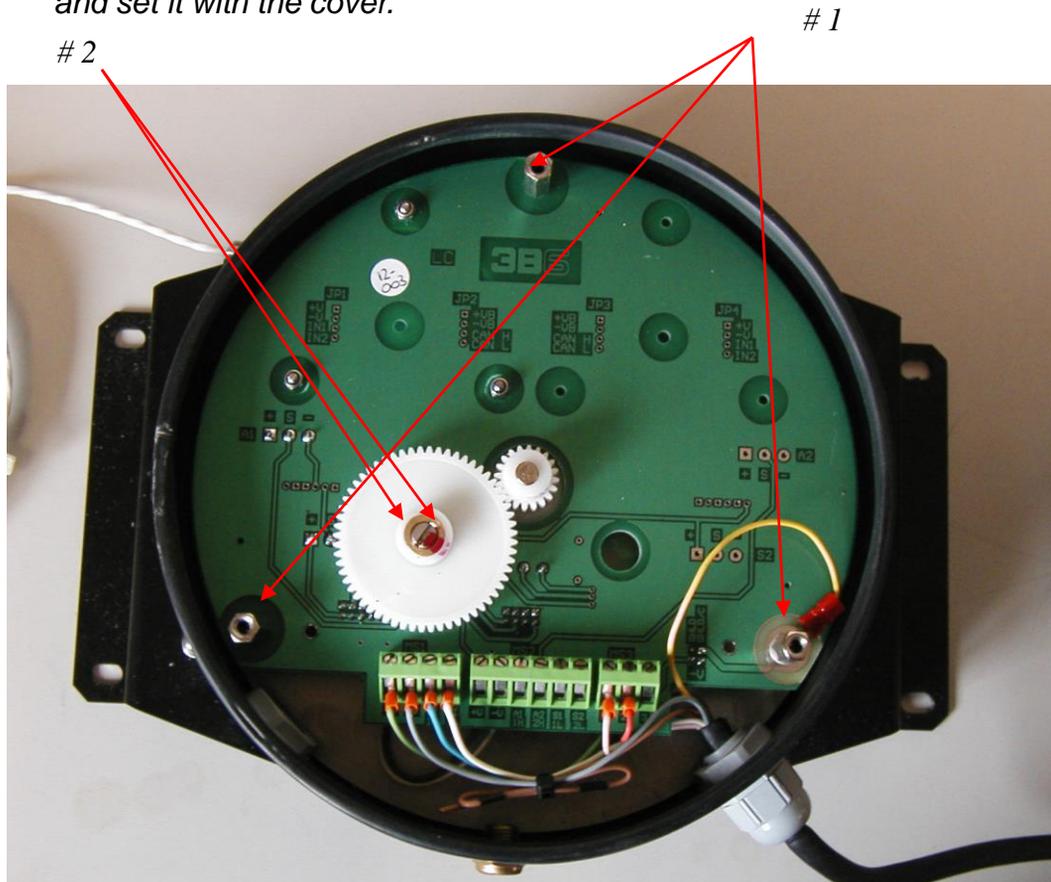
5 mm nuts

NOTE: newer style pots have two posts for mounting. Adjustment is made by moving the PCB after installed and then tighten hardware



ACT Length pot removal

1. Remove the three socket head cap screws on the cover of the cable reel using a 8mm wrench and ground wire. Set the hardware and cover in a safe place to avoid damage.
2. Remove the two set screws from the length gear drive located on the side of the gear using a 1.5 mm allen wrench. Do not replace these set screws!
3. Using your hand lift the large length gear straight out from the reel and off the shaft of the length pot. Do not pry on this with tools or damage will result! Remove the gear and set it with the cover.

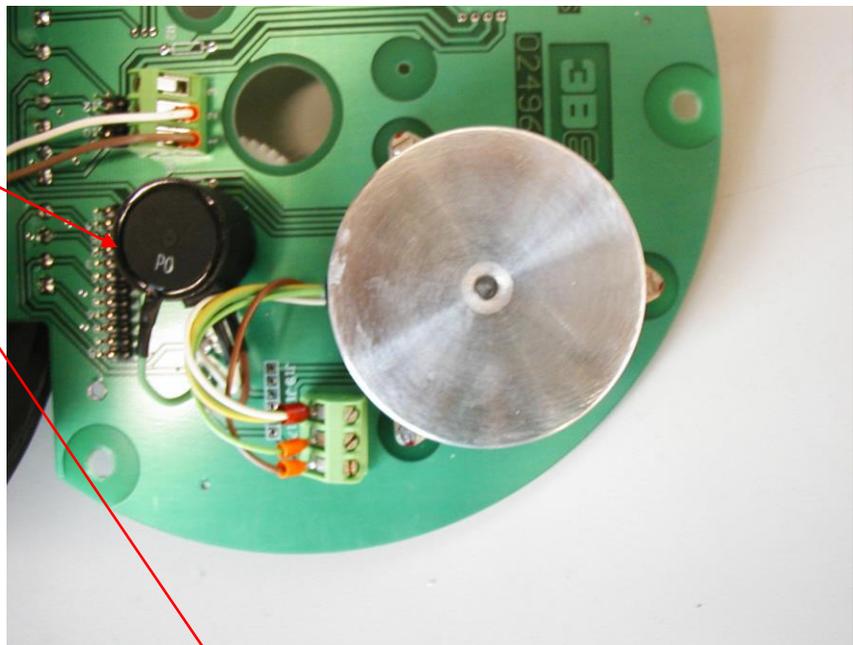


ACT Length pot replacement

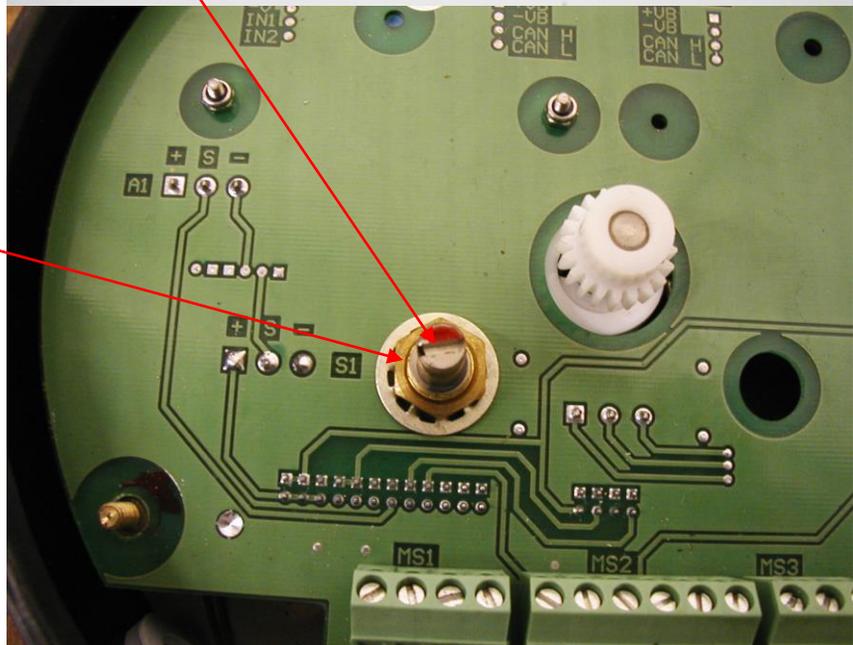
1. Carefully fold the pcb over to access the length pot on the back side of the pcb. Do not let the pcb hang from the wiring, which will result in damage to the A-2-B or other wiring.
2. Place your hand on the pot and using a 13mm wrench loosen the length pot nut on the front side of the pcb, turn it counter clockwise to loosen it and remove it and the washer.

Length Pot

1



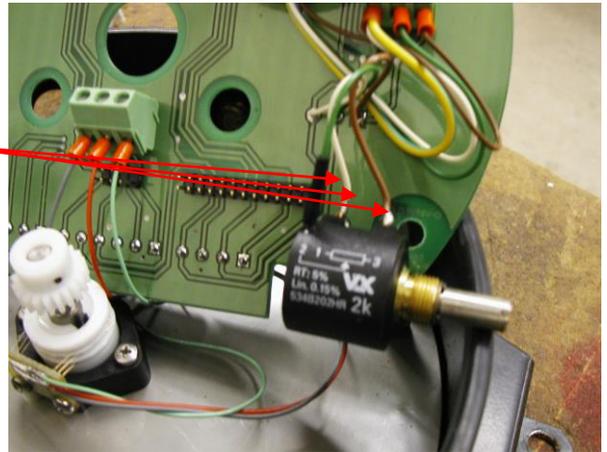
2



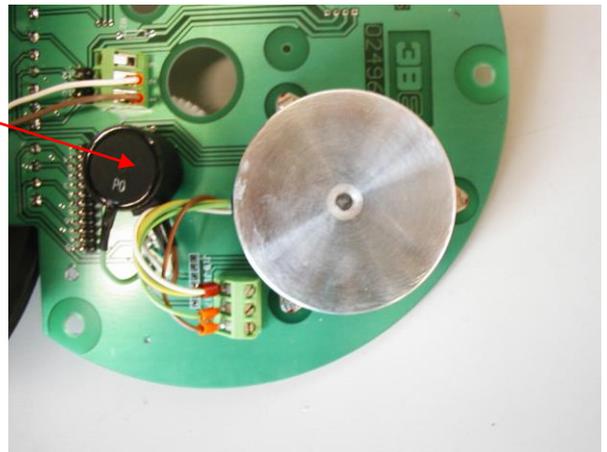
ACT Length pot removal

1. Remove the wires on the existing pot at the length pot terminals with a soldering iron (40 watts max).
2. Solder wires back on new length pot (green is output, brown is ground and white is +5vdc). Insert the pot back into the pcb and position it as indicated below, replace washer and nut then tighten nut from the front of the pcb.
3. Place your hand on the pot and using a 13mm wrench loosen the length pot nut on the front side of the pcb, turn it counter clockwise to loosen it and remove it and the washer.

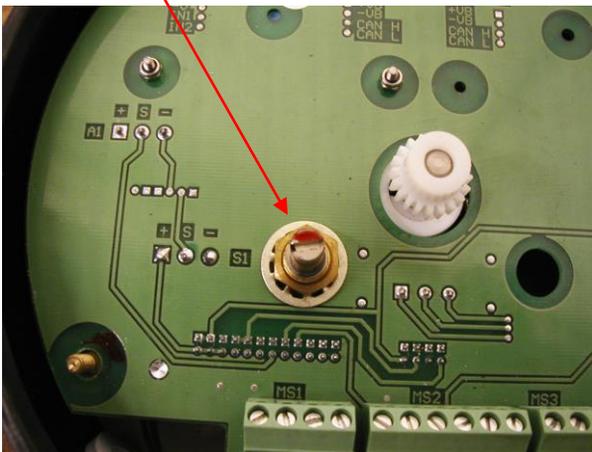
1



2



3



ACT Length pot replacement

1. *Replace the white large gear and press it back onto the length pot shaft.*
2. *Replace the ground wire and mounting lugs. Make certain the length gear assembly is meshing with the small gear drive. See page 13 for adjustment.*

